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M/023/007

FAX TRANSMISSION COVER SHEET

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Date: 4-18-00
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To: Beth Woodruff (DWR) and Wayne Hedburg (DOGM)
Fax: 538-6016 and 359-3940
Subject: Transmittal of Revised Excess Fluid Management Plan for
From: North City
Bob Bayer

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**NORTH LILY MINING COMPANY
EXCESS FLUID MANAGEMENT PLAN**

North Lily Mining Company (North Lily) has prepared this Excess Fluid Management Plan in response to Order 3 of the Utah Division of Water Quality's (DWQ) Notice of Violation and Order, Docket No. UGW20-04.

Background

North Lily Mining Company has been managing fluids in its Silver City, Utah former gold heap leach facility by recirculation and enhanced evaporation for the last three years. During that period of time seasonal fluctuations in fluid inventory volume occurred. Since last fall, enhanced evaporation by spray application has been conducted continuously. Since last fall, fluids returning to the pregnant solution pond from the heap have been contained in the pregnant solution pond by successful operation of the enhanced evaporation and solution pump-back activities. Fluid levels in the pregnant solution pond appear to have peaked in early March 2000 (see attached graph) and have begun to decline since that time, according to daily water level observations made at the facility. Since at least as far back as Fall 1999, fluids have not flowed out of the pregnant solution pond to the barren pond. However, in order to proceed with comprehensive closure and reclamation and to do so in a timely manner, further enhanced evaporation is necessary.

Proposed Plan Concepts for Fluid Management

The proposed plan for elimination of excess draindown and pond fluids is proposed to take place both on the leach pad and in the pregnant solution pond. This plan would consist of enhanced evaporation in two locations: adjacent to the west margin of the leach pad above the solution collection ditch and within the pregnant solution pond itself. The in-pond system will enable North Lily to dispose of the current pond inventory and fluids that will or may continue to drain from the leach pad at a relatively rapid rate through the remainder of 2000 and possibly beyond.

The latter system will be installed after necessary repairs to the pregnant solution pond primary liner have been made. This system will allow North Lily to cease re-application of fluids to the majority of the leach pad surface, enabling most of the spent leach material on the pad to begin to dry and drain down. When, as anticipated, the in-pond system demonstrates sufficient evaporative capacity during the late spring and early summer months to evaporate all solution that returns from the heap as well as any water not yet evaporated from the barren and overflow ponds, the pad-margin evaporation system will cease to operate. The components of this system would be removed from the pad margin during the July-August period so that regrading of the pad margin can be completed and topsoil re-application and revegetation can begin.

The in-pond system would continue to function until the final, post-closure solution management system is installed in Fall 2000. It is also proposed that the in-pond evaporation system remain in tact and operational, as a back-up system, through no later than mid-2001 in the event that the to-be-determined post-closure solution management system alone cannot adequately dispose of the draindown fluid volume that *may* persist until the vegetative cover on the leach pad is established.

Proposed Plan Details

Project Staffing. North Lily has engaged the services of JBR Environmental Consultants, Inc., (JBR) to provide overall project management and technical assistance. In addition, working through JBR, Mr. Walt Shubert has been retained on a part-time basis, as the site manager for the closure and reclamation project. Mr. Shubert has identified a number of other temporary staff members with whom he has worked in the past and who will also be employed part-time, through JBR, as-needed on the project. These personnel include evaporation system installers and operators, an electrician, and laborers. The resources of Mr. Shubert and JBR will also be used to select vendors to supply the equipment, material, and sub-contractor services necessary to complete the closure work. These goods and services will also be provided through JBR. North Lily will advance to JBR the funds necessary to pay for these services prior to the undertaking of each step of the closure process. The business arrangements necessary to put this arrangement in place will be completed by April 21, 2000.

Assessment of Pump Capacity. Mr. Shubert has recommended that a floating submersible pump be installed in the pregnant solution pond. This pump would be sized to have the capacity to provide water at a pressure of 50 psi to both the pad margin and in-pond evaporation systems. This pump would serve as the primary pump for the enhanced evaporation systems. North Lily is currently attempting to locate a rental source for such a pump. In the event that a rental source is not identified, a pump will be purchased. The existing pump would then be used as a back-up pump and also to pump the standing water from the barren and overflow ponds to the pregnant pond from which it can be evaporated. The new pump is anticipated to be located and on-site, ready for installation on or before April 28, 2000. A compatible flow meter will be acquired at the same time so that the rate of solution distribution to the pad margin evaporation system can be assessed. A second flow meter will be installed to monitor the distribution to the pregnant solution evaporation system when that system is installed. Also, North Lily will temporarily install a flow meter in the current solution return line to gauge the application rate that has been achieved in the recent past by the existing pump. This gauge will be allowed to operate and will be regularly read during the time it takes to clean the pad margin solution channel and install the pad perimeter evaporation system.

Pad Draindown Return Flow Measurement. A device to measure the return flow rate in the pad/pregnant pond spillway will be acquired and installed after the spillway cleaning and repairs have been completed. Currently, JBR believes that a flume will be able to be installed with less

damage to the liner than can a weir. The device selected will have the capability to allow flow measurement over the anticipated range of return flow rates that would pass through it. The flume or weir will be installed during the week of May 1, after the pad margin drainage channel has been repaired as described below.

Restoration of Pad Margin Solution Channel. The pad margin solution collection channel on the west side of the heap was covered as part of reclamation activities in 1997. As part of this effort a perforated solution collection pipe was installed to collect and transmit ongoing solution draindown to the pregnant pond. The channel is currently not capable of adequately transmitting storm-derived surface flows and the collection pipe is non-functional. Using a track hoe, this channel will be cleaned of heap material to restore surface flow and in the process the perforated pipe will be removed. Care will be taken to leave a thin layer of heap material in the channel to protect the liner itself from damage by the backhoe bucket. As the channel is cleaned of heap material, careful observations will be made for evidence of damage to the liner that may have occurred during the reclamation regrading or that occurs as part of the clean-out process. Observed liner tears or punctures will be repaired using the methods to be applied for pregnant pond solution repairs (discussed below). Channel restoration earthwork is planned for the week of April 24, 2000. Any necessary liner repairs will take place either during that week or during the week of May 1.

Pad Solution Channel and Pregnant Pond Liner Repair. Minor repairs (small punctures, for example) to the solution channel liner will be made by North Lily personnel and/or JBR temporary staff using the methods used by North Lily in the past and previously presented to DWQ and DOGM. Major liner tears in the pad solution channel and all pregnant solution pond repairs will be conducted by a third-party contractor, Rainy Day Water of West Valley City, Utah. The repair methods for PVC liners used by North Lily and previously described to both DWQ and DOGM will also be used by the liner sub-contractor. Liner that cannot be satisfactorily repaired by the liner subcontractor will be replaced. In the pregnant pond, and possibly the pad spillway as well, existing liner that cannot be repaired will be allowed to remain in place and the replacement liner will be installed over the existing liner to provide a smooth surface for installation. The replacement liner will be joined with adhesive to suitable parts of the existing primary liner, as determined by the liner subcontractor. The pond bottom is covered with pad material eroded from the leach pad. Except as necessary to achieve a proper adhesive joint, the liner on the pond bottom and the lower portions of the pond side slopes will not be cleaned of this material. Repairs to the pregnant solution pond primary liner are currently anticipated to begin during the week of June 12, 2000.

PVC Liner Repair QA/QC. The liner repair subcontractor will use the vacuum box method to test PVC adhesive seals. The vacuum box, which has a clear glass top, is placed over the puncture patches or at potential tension points and at other random points along large adhesive joints after a soap solution has been applied to the test area. The vacuum box has flexible seals along its base which allow the box to adhere to the smooth liner surface when a vacuum is

applied. After vacuum has been achieved, the liner joint being tested is observed through the glass box top for evidence of leakage in the form of active bubbles in the soap solution. Joints that are observed to leak are tested further and all leaking segments are re-glued and the test is repeated. This process continues until all glue joints have passed the vacuum box test.

Re-establishment of Pregnant Pond Leak Detection System. The pregnant pond leak detection system consists of a filter fabric membrane between the two PVC liners. This membrane is intended to wick solution that leaks through the pond liner to an open leak detection sump located below the primary liner and above the secondary liner. The sump is accessed during operations by way of a sampling port (PVC pipe) and leaks are detected and the volume of leakage determined by pumping and measuring the volume of water from the sump on a daily basis. The maximum quantity of leakage that is allowed is 200 gallons per acre per day. The effectiveness of liner repair will be assessed by activating the leak detection system and determining the quantity of leakage to the sump in the manner described above. This will take place after the liner repairs have been completed and this is anticipated to occur between June 21 and June 30, 2000.

Installation and Operation of Pad Margin Evaporation System. The pad margin evaporation system will be located parallel to the west pad margin approximately 20 to 30 feet from the edge of the outboard side of the solution collection trench on the west edge of the leach pad. It will consist of a linear array of emitters (Bete Fog Nozzles) installed directly into either 3-inch or 4-inch-diameter HDPE pipe at 15 foot intervals (approximate fog emission diameter is 15 feet). The array will be located on a level bench, approximately 8 feet in width which will be established when the adjacent solution collection trench is cleaned out. The active or operational length of the array will be at least 1000 feet which will provide for a minimum of 65 emitters. At a discharge rate of 2.5 gpm per nozzles and with an assumed daily (24 hours) average evaporation rate of 20 percent, this system will evaporate a minimum of 32.5 gpm, 46,800 gallons per day, or 327,600 gallons per week. The location of this system along the west-facing pad slope will optimize evaporation and pad draindown by exposing the surface to direct sun for most of the day, taking advantage of heat stored in the west pad slope to enhance night-time evaporation, minimizing the area of pad surface exposed to solution re-application, and maximizing the rate of return of solution from the pad to the pregnant pond. As a result, and given the time of year, the assumed 20 percent evaporation rate is likely to be a minimum figure. Construction of the pad margin evaporation system will commence no later than the week of May 8, 2000 and system start-up will occur by the end of that week.

Installation and Operation of In-Pond Evaporation System. The in-pond evaporation system will be located in the pregnant solution pond. It will consist of a rectangular array of emitters (Bete Fog Nozzles) installed directly into either 3-inch or 4-inch-diameter HDPE pipe at 15 foot intervals. The array will consist of two adjacent rectangular pipe arrangements each approximately 60 feet by 40 feet and sharing a common 60-foot pipe segment. The pipes on the margin of the pad will be located a minimum of 20 feet from the pond margins. The active or

operational length of the array will be approximately 480 feet and will provide for approximately 32 emitters. When operational, this system will have the capability of evaporating approximately 16 gpm at a 20 percent evaporation rate. When it is demonstrated by application rates and return flow measurements that the in-pond system can evaporate all drain down returns, the pad margin system will be taken off line. This will probably be done gradually, perhaps in a one-day-on, one-day-off manner. The system is anticipated to be constructed and in operation by approximately July 1, 2000; however, its operation is dependent on the adequacy of Discharge Minimization Technology (DMT) as assessed by the leak detection system test and approved by DWQ.

Estimation of Pad Fluid Draindown Rate Following Cessation of Solution

Application/Evaporation on the Leach Pad. The anticipated draindown rate following cessation of solution evaporation on the leach pad must be estimated, taking into account remaining solution inventory held in the pad plus the effects of future direct precipitation, before a post closure solution management plan and system can be designed. This estimate will be performed by using the following information: solution application rates (flow meter) and return rates from the pad (weir or flume); measure precipitation amounts; and evaporation rates estimated by measuring the performance of the evaporation systems. This information will be collected throughout the evaporation process after the requisite measuring equipment is installed and operational. However, it is estimated that at least four to six weeks of return flow data following cessation of pad margin evaporation will be necessary to establish an adequate draindown curve. Also, estimates of future, post-closure draindown rates will have to be made. This will be accomplished with the assistance of the HELP model. Accordingly, considering the estimated schedule for operation of the pad margin system through approximately July 1, 2000, the fluid draindown rate estimate is not likely to be completed before September 1, 2000.

Post-Closure Solution Management Plan, Disposal System Design, and Construction. The post-closure solution management plan will be developed in concept by June 30, 2000. This conceptual plan, currently anticipated to an engineered infiltration system, will be presented to DWQ and DOGM at that time. Upon obtaining DWQ and DOGM approval of the system concepts and after the post-closure draindown rates have been estimated, the design and location of the system will be finalized for agency approval. This final design is currently estimated to be completed no later than September 15, 2000. If approved by both DWQ and DOGM, construction can begin by approximately November 1, 2000, the system can be installed and operational by year end. In addition to this system, the in-pond evaporation system will be maintained in operating condition and operated as necessary if it is determined that the post-closure solution management system cannot dispose of all anticipated draindown fluid. This system would be maintained in operating condition and operated as necessary through mid-2001 or until it is determined in conjunction with DWQ and DOGM that the post-closure solution management system has adequate capacity to dispose of all residual draindown fluids.